

DEPARTMENT OF TRANSPORTATION**DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:**Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-001697**Date Inspected:** 28-Feb-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Fu Yu Hong**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG Deck panels**Summary of Items Observed:**

CALTRANS Quality Assurance (QA) Inspector, Alfredo Acuna was present for the fabrication scheduled for this project at the ZPMC facility in Shanghai, China for the San Francisco Oakland Bay Self Anchored Suspension Bridge.

The QA inspector performed ultrasonic testing (UT) to the second PMT from 02/27/2008. The QA inspector found results were as follows: weld joint # 3 were found rejectable indications at Y location 120 mm with 24 mm of length of lack of penetration (LOP), Y location 145 mm with 10 mm LOP, Y location 185 mm with 5 mm of LOP and Y location 207 with 25 mm of LOP (total length 65 mm). Weld joint # 6 was found a LOP of 8 mm length and depth of penetration (DOP) less than 70 % of the design thickness with approximately 4.1 mm LOP and 7.9 mm DOP. The DOP was based on 12 mm thickness measured by ZPMC technician with a dual element transducer and thickness gauge (Note: The QA inspector had not seen ZPMC calibrating with step wedge before performing thickness verifications). A UT form TL_6027 was generated on this date. Upon the results of the ultrasonic testing, the QA inspector had a conversation with ZPMC representative Fu Yu Hong the QA inspector informed ZPMC representative the QA inspector want to verified UT indications found by QA inspector that appeared to be overlooked by ZPMC QC inspector. The QA inspector witnessed UT verification performed by ZPMC technician E Shuiqin. Ms. E Shuiqin informed that the indication were acceptables. The QA inspector requested Ms. E Shuiqin that the QA inspector wanted to witness her calibrating on the PJP ZPMC calibrations blocks. The QA witnessed Ms. E Shuiqin calibrating. The QA Inspector asked Mr. Fu Yu Hong why in her calibration sheet Ms. E Shuiqin was adding 0.8 mm in lieu of 1.2 mm. Mr. Fu Yu Hong translated from Ms. E Shuiqin that ZPMC was using 0.8 mm in lieu of 1.2 mm (ABF/ZPMC/CT agreed on the OBG Mock-up 0.8 mm correction factor for UT verifications) and that she was not aware that ZPMC needed that used 1.2 correction

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factor. The QA inspector asked if ZPMC had a last Supplementary Ultrasonic Testing Procedure to verify Depth of penetration of partial U-ribs welds # ZPQC-UT-02 revision 8. Mr. Fu Yu Hong and Ms. E Shuiqin did not know. The QA inspector had a conversation with Caltrans Task Leader Dave McClary. The QA inspector informed Mr. McClary that ZPMC was using a correction factor on the LOP of 0.8 mm in lieu of 1.2 mm. Mr. David McClary informed that 1.2 mm correction factor is correct and that he would address this issue with ABF representatives.

Later, the QA inspector had a conversation with Ms. E Shuiqin and ABF representative Gang Jiao. The QA inspector showed the copy to ZPMC UT approved procedure. Ms. E Shuiqin confirmed with ABF representative that ZPMC was using 0.8 mm in lieu of 1.2 mm correction factor. Mr. Gang Jiao relayed to the QA inspector that ZPMC had the UT procedure for about one month.

The QA inspector wrote an incident reports for the following items:

1. ZPMC under estimating rejectable indications found on the PMT welded on 02/27/2008
2. ABF allowed ZPMC performed ultrasonic testing up without following the approved ultrasonic procedure to verify depth of penetration of partial penetration U-ribs welds. ZPMC has used from the start of the deck panel fabrication on 02/14/2008 a correction factor of 0.8 mm in lieu of 1.2 mm per ZPMC's UT procedure. Supplementary Ultrasonic Testing Procedure to verify Depth of penetration of partial U-ribs welds # ZPQC-UT-02 revision 8
3. ABF allowed ZPMC to continuing the fabrication of deck panels DP-026-001 and DP-030-001 without completing the two consecutive successful production monitoring tests on 02/27/2008.
4. ABF allowed ZPMC to welding two consecutive production monitoring test (PMT) using different welding operators after the first PMT was rejected by ultrasonic testing. Welding operator, Feng Chuan Hong ID # 059371 welded on the second PMT and Song Yin Shu on the third PMT in lieu of Yuan Fen Chuan, ID # 059355 who welded on the first PMT. Other welding operators were the same with the exception that on the third PMT ZPMC utilized only 4 welding operators.

U-Ribs Partial penetration joint (PJP) Geometric

The QA inspector performed random verifications on the bevel joint preparation at the U-ribs U-38, U-27 and U-64 designated to be use on the deck plate DP-065-001. The QA inspector observed that ZPMC prepared closed rib partial joint penetration single bevel grooves that have root faces that do not comply with the approved fabrication procedures and the welding procedure specification (which specify a root face tolerance of 1.8 ± 0.4). ABF and ZPMC representatives did not provide to the QA inspectors with results (by verbal or by marking on the steel) of U-ribs joint geometry dimensional ZPMC's QC acceptance before ZPMC installed the closed ribs to the deck plate. The QA inspector had a conversation with ABF representative Warren Buehler. Mr. Warren Buehler informed that ZPMC would check and record dimensions on one U-rib for every five ribs. Root faces with less the minimum required of 1.4 mm were observed on three out of three closed ribs inspected by the QA inspector after ZPMC welded the diaphragms: U-38, U-27 and U-64 designated for the deck panel DP-065-001.

Summary of Conversations:

As noted above.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

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Inspected By: Acuna,Alfredo

Quality Assurance Inspector

Reviewed By: Cuellar,Robert

QA Reviewer